

AMENDMENTS TO THE DRAWINGS

Please enter the attached new sheet of Fig. 11. New sheet of Fig. 11 is supported by original Fig. 8. In Fig. 11, the gas injection apparatus 9' is added instead of the gas injection apparatus 9 illustrated in Fig. 8. The amendment is supported at page 23, lines 10-15 of the original specification. No new matter has been added.

REMARKS

(1) Claims 1-15 are pending in this application, of which claims 1 and 15 have been amended. Claim 16 has been cancelled in this Response. Claims 8-10 were withdrawn from further consideration. No new claims have been added.

(2) Claims 1-7 and 11-16 were objected to because of the following informalities: the recitation, "being extending vertically" (line 16) should read --extending vertically--.

In this Response, claim 1 has been amended in accordance with the Examiner's suggestion. Withdrawal of the objection is respectfully requested.

(3) The Examiner states that the drawings were objected to under 37 CER 1.83(a) since the claims recite features which are not shown in the drawings. Page 2 of the Office Action.

In this Response, new sheet of Fig. 11 has been submitted herewith. Withdrawal of the objection is respectfully requested.

(4) Claims 15-16 were rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the written description requirement. The Examiner states that the application does not have support for an apparatus having both a first gas injection means and a second gas injection means. Page 3 of the Office Action.

In this Response, claim 15 has been amended to be an independent form including the recitation of claim 16. Amended claim 15 does not recite an apparatus having both a first gas injection means and a second gas injection means. Withdrawal of the rejection is respectfully requested.

(5) Claims 1-4, 6-7 and 14-16 were rejected under 35 U.S.C. §103(a) as being unpatentable over the obvious modification of Swift (U.S. Patent No. 6,032,464). Page 4 of the Office Action.

Claim 1 has been amended to incorporate the recitation that argon is injected to flow downward inside the loop tube. As stated by the Examiner, Swift (U.S. Patent No. 6,032,464) does not teach that the torus (Fig. 13C) has a gas injection apparatus. Nonetheless, although the Examiner state that “Swift does suggest providing an apparatus that inject gas ... to either the top or bottom side of the device (page 5 of the Office Action),” Swift does not suggest so. Swift is silent about the provision of a gas injection apparatus and/or the location thereof.

None of the cited references teaches the missing elements of Swift (U.S. Patent No. 6,032,464). Garrett (U.S. Patent No. 5,953,921) teaches gas fill part 22, but which is located at the side of the loop tube 20. *See* Fig. 1. Garrett (U.S. Patent No. 5,953,921) does not teach the requirements of claim 1 that “a first gas injection apparatus is disposed at the center of the first connection tube portion located at an upper side, such that argon is injected to flow downward

inside the loop tube.” It is unpredictable for one skilled in the art to construe that Swift teach “an apparatus that inject gas ... to either the top or bottom side of the device, (page 5 of the Office Action).” It is not a routine modification for an artisan to invent the features of the claimed invention from the teachings by the prior art.

In addition, Swift (U.S. Patent No. 6,032,464) merely teaches that a gas providing more power density, such as helium, may be used instead of argon (col. 9, lines 52-53). Swift (U.S. Patent No. 6,032,464) does not teach or suggest the location of the gas injection apparatus to inject argon. It is unpredictable for an artisan to reach the claimed location of the gas injection apparatus to inject argon without hindsight obtained from the invention described in the present application.

None of the references teaches the location for gas injection apparatus to inject argon. Even a combination of the cited references does not make the claimed invention. Reconsideration of the rejection is respectfully requested.

(6) Claims 5-6, 11 and 13 were rejected under 35 U.S.C. §103(a) as being unpatentable over the modification of Swift (U.S. Patent No. 6,032,464) in view of Swift (U.S. Patent No. 6,164,073). Page 6 of the Office Action.

These claims depend on amended claim 1. The same arguments in Item (5) *supra* apply.
Reconsideration of the rejection is respectfully requested.

(7) Claim 12 was rejected under 35 U.S.C. §103(a) as being unpatentable over the obvious modification of Swift (U.S. Patent No. 6,032,464) in view of Smith (U.S. Publication 2003/0192324) or Belaire (U.S. Patent No. 4,057,962). Page 8 of the Office Action.

Claim 12 depends on amended claim 1. The same arguments in Item (5) *supra* apply.
Reconsideration of the rejection is respectfully requested.

(8) Claims 1-4, 6-7 and 14-16 were rejected under 35 U.S.C. §103(a) as being unpatentable over Swift (U.S. Patent No. 6,032,464) and any one of Wighard (U.S. Patent No. 5,813,234), Garrett (U.S. Patent No. 5,953,921), Garrett (U.S. Patent No. 5,647,216). Page 9 of the Office Action.

The same arguments made in Item (5) with respect to Swift (U.S. Patent No. 6,032,464) apply to this rejection. Additionally, the applicants reply as follows: Neither Wighard (U.S. Patent No. 5,813,234) and Garrett (U.S. Patent No. 5,647,216) teaches the location of the gas injection apparatus.

Garrett (U.S. Patent No. 5,953,921) teaches a gas fill part 22, but which is located at the side of the loop tube 20. *See* Fig. 1. Garrett (U.S. Patent No. 5,953,921) does not teach the requirements of claim 1 that “a first gas injection apparatus is disposed at the center of the first connection tube portion located at an upper side, such that argon is injected to flow downward inside the loop tube,” or the requirements of claim 15 that “a second gas injection apparatus is disposed at the center of the second connection tube portion located at an lower side, such that helium is injected to flow upward inside the loop.”

None of the references teaches the claimed location for gas injection apparatus to inject argon in amended claim 1. None of the references teaches the claimed location for gas injection apparatus to inject helium in amended claim 15. Even a combination of the cited references does not make the claimed invention. Reconsideration of the rejection is respectfully requested.

(9) Claims 5-6, 11 and 13 were rejected under 35 U.S.C. §103(a) as being unpatentable over Swift (U.S. Patent No. 6,032,464) and any one of Wighard (U.S. Patent No. 5,813,234), Garrett (U.S. Patent No. 5,953,921), Garrett (U.S. Patent No. 5,647,216) and further in view of Swift (U.S. Patent No. 6,164,073).

These claims depend on amended claim 1. The same arguments in Item (8) *supra* apply. Reconsideration of the rejection is respectfully requested.

Application No. 10/594,278
Art Unit 3744

Submission under 37 C.F.R. §1.114
Attorney Docket No. 063029

(10) If the Examiner believes that this application is not now in condition for allowance, the Examiner is requested to contact the undersigned attorney at the telephone number indicated below to arrange for an interview to expedite the disposition of this case. If this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. The fees for such an extension or any other fees that may be due with respect to this paper may be charged to Deposit Account No. 50-2866.

Respectfully submitted,
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SY/mt

Attachment: New Sheet of Drawing (Fig. 11)